

because an unsaturated epoxide and unsaturated carboxylic acid must possess a non-polymerized unsaturated moiety.

Applicants respectfully traverse these rejections.

Regarding the first assertion, Applicants respectfully submit that other forms of (A) can be found in the specification at page 3, line 38 - page 4, line 4, and page 4, lines 23-24. In addition, additional examples of (C) can be found in the specification at page 5, lines 11-17.

Regarding the second assertion, Applicants respectfully submit that generic terminology may be found in the specification at the paragraph bridging pages 1 and 2 of the specification as well as page 2, lines 3-10.

Regarding the third assertion, Applicants respectfully submit that the Patent Office has failed to 1) provide any evidence or reasoning of why a non-polymerized glycidyl (meth)acrylate as (A), ethylene-maleic anhydride copolymer as (B) and non-polymerized (meth)acrylic or maleic acid as (C) would questionably provide a crosslinked phase, and thus, 2) rebut the presumption that Applicants' disclosure is accurate. *See In re Marzocchi*, 439 F.2d 220, 224, 169 USPQ 367, 370 (CCPA 1971) and M.P.E.P. §2164.04. Even assuming what the Office alleges is true, the presence of inoperative embodiments within the scope of a claim does not necessarily render a claim nonenabled. The standard is whether a skilled person could determine which embodiments that were conceived, but not yet made, would be inoperative or operative with expenditure of no more effort than is normally required in the art. *See Atlas Powder Co., v. E.I. du Pont de Nemours & Co.*, 750 F.2d 1569, 1577, 224 USPQ 409, 414 (Fed. Cir. 1984) and M.P.E.P. §2164.08(b).

Regarding the fourth assertion, an epoxide is an organic compound containing a reactive group resulting from the union of an oxygen atom with two other atoms (usually carbon). Furthermore, a carboxylic acid is any of a broad array of organic acids. See attached *Hawley's Condensed Chemical Dictionary*, 13th Edition, 1997. There is no requirement that an epoxide or an organic compound be a non-polymerized unsaturated moiety.

Furthermore, (A) can be the copolymers of ethylene and of an unsaturated epoxide, such as copolymers of ethylene, of an alkyl (meth)acrylate and of an unsaturated epoxide (specification, page 3, line 38 - page 4, line 1), and (C) can be a copolymer of ethylene and of (meth)acrylic acid. There is no inconsistency because an unsaturated epoxide (A) or unsaturated carboxylic acid (C) may be, for example, a copolymer having unsaturated terminal groups. Thus,

a copolymer may fall within the generic categories of unsaturated epoxide (A) and unsaturated carboxylic acid (C).

Furthermore, the test for enablement is whether one skilled in the pertinent art can make and use the claimed invention without undue experimentation (*In re Wands*, 858 F.2d at 731, 737, 8 U.S.P.Q.2d 1400, 1404 (Fed. Cir. 1988) and M.P.E.P. §2164.01). The fact that experimentation may be complex does not necessarily make it undue, if the art typically engages in such experimentation (*Massachusetts Institute of Technology v. A.B. Fortua*, 774 F.2d 1104, 227 U.S.P.Q. 428 (Fed. Cir. 1985) and M.P.E.P. §2164.01). The undue experimentation factors (M.P.E.P. §2164.01(a)) include:

- (A) The breadth of the claims;
- (B) The nature of the invention;
- (C) The state of the prior art;
- (D) The level of one of ordinary skill;
- (E) The level of predictability in the art;
- (F) The amount of direction provided by the inventor;
- (G) The existence of working examples; and
- (H) The quantity of experimentation needed to make or use the invention based on the content of the disclosure.

All the factors must be considered when determining whether the claims are enabled (M.P.E.P. §2164.01(a)). In this case, specific Examples are provided at pages 7-8, as well as illustrative embodiments of (A), (B), and (C) at page 3, line 16 - page 5, line 24. Such working examples and other guidance would enable one skilled in the art to practice the invention without undue experimentation, and thus, it is respectfully submitted that the rejection under 35 U.S.C. §112, first paragraph, should be withdrawn.

Rejections Under 35 U.S.C. §112, Second Paragraph to Withdrawn Claims

Claims 21, 22 *sic*, 25-29, 35, 37, 39 and 40 are allegedly indefinite. Applicants respectfully traverse this rejection and reserve the right to respond once these claims are rejoined to the allowed claims.

Claim Rejections Under 35 U.S.C. §103

Claims 20, 23, 32 and 38 are allegedly unpatentable over U.S. Pat. No. 5,395,881 (Spelthann). The Office admits the prior art terpolymer containing an unsaturated carboxylic acid is not exemplified, but alleges it would be obvious to incorporate a carboxylic acid monomer in order to facilitate the curability. Applicants respectfully traverse these rejections.

Spelthann discloses a polyolefin composition (column 1, lines 7-9). The polymer composition is a blend of a first thermoplastic polymer component and a second polar thermoplastic polymer component (column 1, lines 25-37).

The first thermoplastic polymer component includes a) a non-polar thermoplastic polyolefin; and (b) a compatibilizing polymer which is an olefin polymer containing a copolymerized polar monomer, and a carboxylic acid or a derivative thereof. The derivative may be an anhydride (column 3, lines 36-40).

The second polar thermoplastic polymer component includes a) a polar ethylene copolymer and (b) a polar ethylene compatibilizing copolymer. The polar ethylene copolymer consists essentially of (i) ethylene, (ii) at least one copolymerizable, ethylenically unsaturated organic compound, and (iii) carbon monoxide. Column 1, lines 36-44. The copolymerizable, ethylenically unsaturated organic compound is a termonomer containing unsaturated mono- and dicarboxylic acids of 3-20 carbon atoms, esters of such unsaturated mono- or dicarboxylic acids, vinyl esters of saturated carboxylic acids wherein the acid group has 1-18 carbon atoms, vinyl alkyl ethers wherein the alkyl group has 1-18 carbon atoms, acrylonitrile, methacrylonitrile, copolymerizable unsaturated hydrocarbons such as alpha-olefins of 3-12 carbon atoms, ring compounds such as norbornene and vinyl aromatic compounds. Column 4, lines 27-37. More preferred copolymers include those in which vinyl acetate, an alkyl (1-8 carbons) acrylate or alkyl methacrylate (particularly n butyl acrylate) is the termonomer. Column 4, lines 44-47. Exemplary termonomers are n-butylacrylate *etc.* Column 5, lines 60-65.

The polar ethylene compatibilizing copolymer consists essentially of (i) ethylene, (ii) optionally at least one copolymerizable, ethylenically unsaturated organic compound, and glycidyl acrylate or methacrylate. Column 1, lines 45-52. The optional copolymerizable, ethylenically unsaturated organic compound of the compatibilizing copolymer is methyl acrylate, or most preferably n-butyl acrylate. Column 4, line 66 - column 5, line 8.

However, to establish *prima facie* obviousness of a claimed invention, all claim features

must be taught or suggested by the prior art. See *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974), M.P.E.P. §2143.03. Moreover, the fact that a claimed feature might be found within the broad field of the prior art and one might arrive at it by selecting specific items and conditions does not render that feature obvious in the absence of some direction or reason for making the selection. See *Ex parte Koon*, 132 U.S.P.Q. 359 (Pat. Bd. of App. 1962) and *In re Baird*, 29 U.S.P.Q. 2d 1550 (CAFC 1994)

Spelthann discloses a polymer composition blend of two polymer components. The first polymer component includes (1) a compatibilizing polymer which is an olefin polymer containing a carboxylic acid or a derivative (anhydride). The second polymer component includes (1) a polar ethylene copolymer consisting essentially of ethylene, at least one copolymerizable, ethylenically unsaturated organic compound, and carbon monoxide; and (2) a polar ethylene compatibilizing copolymer consisting essentially of ethylene, optionally at least one copolymerizable, ethylenically unsaturated organic compound (an acrylate), and glycidyl acrylate or methacrylate.

But Spelthann utterly fails to teach or suggest a thermoplastic polymer having incorporated therein a crosslinked phase, much less a crosslinked phase from a reaction of:

(A) an unsaturated epoxide or a compound different from said unsaturated epoxide and having 2 epoxide functional groups,

(B) a copolymer of ethylene and an unsaturated carboxylic acid anhydride, and

(C) an unsaturated carboxylic acid or an  $\alpha,\omega$ -aminocarboxylic acid.

With respect to the (1) polar ethylene copolymer, Spelthann fails to teach or suggest including an unsaturated carboxylic acid anhydride, and fails to provide sufficient blazemarks or guideposts to motivate one of ordinary skill to use an unsaturated mono- and dicarboxylic acid as the at least one copolymerizable, ethylenically unsaturated organic compound. Rather, Spelthann prefers vinyl acetate, an alkyl (1-8 carbons) acrylate or alkyl methacrylate and exemplifies n-butylacrylate. Thus, there is insufficient motivation for one of skill in the art to modify Spelthann to render the claimed invention *prima facie* obvious.

In view of the above remarks, favorable reconsideration is courteously requested. If there are any residual issues which can be expeditiously resolved by a telephone conference, the Examiner is courteously invited to telephone Counsel at the number indicated below.

Respectfully submitted,



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*Hawley's*  
*Condensed Chemical*  
*Dictionary*

**THIRTEENTH EDITION**

*Revised by*  
Richard J. Lewis, Sr.



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CIP

**carboxylase.** A decarboxylase enzyme, found in plant tissues that acts on pyruvic acid, producing acetaldehyde and carbon dioxide.

Use: Biochemical research.

**carboxyl group.** The chemical group characteristic of carboxylic acids that includes fatty acids and amino acids. It usually occupies the terminal position in the molecule and is capable of assuming a negative charge, which makes the end of the molecule water soluble. Though it is customarily shown as either  $\text{COOH}$  or  $\text{CO}_2\text{H}$ , the structure of the group is



Thus it is composed of a carbonyl group and a hydroxyl group bonded to a carbon atom. The carbon-oxygen unsaturation within the carboxyl group is of a different order from the carbon-to-carbon unsaturation in the alkyl chain in unsaturated fatty acids. For this reason, fatty acids in which no double bond is present except that in the carboxyl group are called saturated.

See fatty acid.

**carboxylic acid.** Any of a broad array of organic acids comprised chiefly of alkyl (hydrocarbon) groups ( $\text{CH}_2$ ,  $\text{CH}_3$ ), usually in a straight chain (aliphatic), terminating in a carboxyl group ( $\text{COOH}$ ). Exceptions to this structure are formic acid ( $\text{HCOOH}$ ) and oxalic acid ( $\text{HOCCOOH}$ ). The number of carbon atoms ranges from one (formic) to 26 (cerotic), the carbon of the terminal group being counted as part of the chain. Carboxylic acids include the large and important class of fatty acids and may be either saturated or unsaturated. A few contain halogen atoms (chloroacetic). There are also some natural aromatic carboxylic acids (benzoic, salicylic), as well as alicyclic types (abietic, chaulmoogic).

See amino acid.

**carboxymethoxylamine hemihydrochloride.**  $(\text{H}_2\text{NOCH}_2\text{CO}_2\text{H})_2 \cdot \text{HCl}$ . Demonstrates anticonvulsant activity by inhibiting glutamic acid decarboxylase and  $\gamma$ -aminobutyric- $\alpha$ -ketoglutaric aminotransferase, increasing the brain  $\gamma$ -aminobutyric acid concentrations. Increases the sugar content of sugarcane, sugar beets, and sorghum. Forms digitoxin derivatives.

Properties: Off-white crystals. Mw 218.59, mp 156°C (decomposes), hygroscopic.

Grade: 98% research.

**carboxymethylcellulose.** (CMC; sodium carboxymethylcellulose; CM cellulose). CAS. 9004-32-4. A semisynthetic, water-soluble polymer in which  $\text{CH}_2\text{COOH}$  groups are substi-

tuted on the glucose units of the cellulose chain through an ether linkage. Mw ranges from 21,000 to 500,000. Since the reaction occurs in an alkaline medium, the product is the sodium salt of the carboxylic acid  $\text{R}-\text{O}-\text{CH}_2\text{COONa}$ .

Properties: Colorless, odorless, nontoxic, water-soluble powder or granules. D 1.59, refr index 1.51, tensile strength 8000-15,000 psi, pH (1% solution) 6.5-8.0, stable in pH range 2-10. Viscosity of 1% solution varies from 5 to 2000 cP, depending on the extent of etherification. Insoluble in organic liquids. Reacts with heavy-metal salts to form films that are insoluble in water, transparent, relatively tough, and unaffected by organic materials. Many of its colloidal properties are superior to those of natural hydrophilic colloids. It also has thixotropic properties and functions as a polyelectrolyte.

Derivation: By reaction of alkali cellulose and sodium chloroacetate.

Grade: Crude, technical (approximately 75% pure), high viscosity, low viscosity, semirefined, refined (99.5+ % pure), USP, FCC.

Use: Detergents, soaps; food products (dietetic foods and ice cream), where it acts as water binder, thickener, suspending agent, and emulsion stabilizer; textile manufacturing (sizing); coating paper and paperboard to lower porosity; drilling muds; emulsion paints, protective colloid; pharmaceuticals; cosmetics.

See cellulose, modified.

**carboxymethylmercaptosuccinic acid.**  $\text{HOOCCH}_2\text{SCH}(\text{COOH})\text{CH}_2(\text{COOH})$ .

Properties: White powder. Melting range 135-138°C. Water solubility of 137 g/100 g (25°C); ethanol solubility of 76 g/100 g (25°C).

Use: Heavy-metal chelator and deactivator.

**carboxymethylpyridinium chloride hydrazide.** See Girard's reagent.

**carboxymethyltrimethylammonium chloride hydrazide.** See Girard's reagent.

**carboxypeptidase.** A proteolytic enzyme found in the pancreas that catalyzes the hydrolysis of native food proteins. It acts on polypeptides, producing simpler peptides and amino acids.

Use: Biochemical research.

**carboxyplast.** A high molecular weight synthetic polymer in which the principal chain contains only carbon and oxygen.

**4-carboxyresorcinol.** See  $\beta$ -resorcylic acid.

**6-carboxyuracil.** See orotic acid.

**carburet of sulfur.** See carbon disulfide.

**Properties:** Highly volatile, unstable liquid; chloroform-like odor D 1.1761 (20/20C); bp 115.2C; bulk d 9.78 lb/gal; vap press 12.5 mm Hg (20C); fp -25C; viscosity 1.12 cP (20C); refr index 1.4358 (25C); flash p 93F (33.9C) (TOC). Miscible with most organic solvents, slightly soluble in water.

**Derivation:** By removing hydrogen chloride from dichlorohydrin.

**Hazard:** Toxic by inhalation, ingestion, and skin absorption; strong irritant, a carcinogen. Flammable, moderate fire risk. TLV: 2 ppm in air.

**Use:** Major raw material for epoxy and phenoxy resins, manufacture of glycerol, curing propylene-based rubbers, solvent for cellulose esters and ethers, high-wet-strength resins for paper industry.

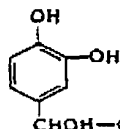
**epichlorohydrin triethanolamine cellulose.**  
See ECTEOLA-cellulose.

**"Epigrade" [Advanced].** TM for source reagent for chemical vapor deposition of Si, Mg, Ca, Ti, Fe, Co, Ni, Cu, Zn, Ge, Sr, Y, Zr, Nb, Ru, Ba, La, Ta, W, Ir, Pt, Au, Pb, Bi, Ce, Er.

**Use:** Chemical vapor deposition of elements.

**epimer.** An isomer that differs from the compound with which it is being compared only in the relative positions of an attached hydrogen and hydroxyl. The isomerism may be represented as  $\text{HCOH}$  and  $\text{HOCH}$ . It is common in sugars.  
See diastereoisomer.

**epinephrine.** (1-methylaminoethanolicatechol; "Adrenalin").  
CAS: 51-43-4 A hormone of the adrenal glands.



**Properties:** (l-Form) Light-brown or nearly white, crystalline powder, odorless. Affected by light. Mp 211-212C, specific rotation -50 to -53.5 (25C). Sparingly soluble in water; insoluble in alcohol, chloroform, ether, acetone, oils; readily soluble in aqueous solutions of mineral acids, sodium hydroxide, and potassium hydroxide.

**Derivation:** From the adrenal glands of sheep and cattle or synthetically from pyrocatechol.

**Grade:** USP.

**Use:** Medicine (vasoconstrictor).

**"Epiphen" [Borden].** TM for an epoxy resin in liquid form. "Epiphen" ER-823 is used in adhesives for rubber, steel, aluminum, or glass. Catalyst is supplied for specific end uses.

**epitaxy.** An oriented crystalline growth between two crystalline solid surfaces of different chemical

composition in which the surface of one crystal offers suitable positions for deposition of a second crystal. This behavior is characteristic of some types of high polymers.

**EPN.** (o-ethyl-o-p-nitrophenyl phenylphosphorothioate).

CAS: 2104-64-5  $\text{C}_{12}\text{H}_{11}\text{P}(\text{C}_2\text{H}_5\text{O})(\text{S})\text{OC}_6\text{H}_4\text{NO}_2$

**Properties:** Light-yellow crystals. Mp 36C, d 1.5978 (30C). Insoluble in water; soluble in most organic solvents. Decomposes in alkaline solutions.

**Grade:** Wettable powders and dusts.

**Hazard:** A cholinesterase inhibitor, absorbed by skin, use may be restricted. TLV: 0.5 mg/m<sup>3</sup> of air.

**Use:** Conon insect pest control, acaricide.

**"Eponol" Resins.** TM for high molecular weight linear copolymers of bisphenol A and epichlorohydrin, produce outstanding surface coatings by solvent evaporation alone.

**"Epon" resins [Shell].** TM for a series of condensation products of epichlorohydrin and bisphenol-A having excellent adhesion, strength, chemical resistance, and electrical properties when formulated into protective coatings, adhesives, and structural plastics.

**"Epotuf" [Reichhold].** TM for epoxy resins, epoxy hardeners, and epoxy esters used as coating vehicles.

**epoxidation.** Reaction in which olefinic unsaturation is converted to a cyclic, three-membered ether by active oxygen agents.

**epoxide.** An organic compound containing a reactive group resulting from the union of an oxygen atom with two other atoms (usually carbon) that are joined in some other way as indicated:



This group, commonly called "epoxy," characterizes the epoxy resins. Epichlorohydrin and ethylene oxide are well-known epoxides. The compounds are also used in certain types of cellulose derivatives and fluorocarbons.

**epoxidized linseed oil.** See "Drapex" [Witco].

**"Epoxybond" [Ailas].** TM for an epoxy adhesive putty in stick form.

**1,2-epoxybutane.** See 1,2-butylene oxide

**3,4-epoxycyclohexane carbonitrile.**

$\text{O}(\text{C}_6\text{H}_9)\text{CN}$

**Properties:** Liquid. D 1.0929 (20/20C), bp 244.5C, fp -33C. Soluble in water.